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Abstract

Purpose. Clinical training is essential part of the dental curriculum. Both clinical environment and Teachers are essential factors which affect the acquired clinical skills. The objective was to assess the perceptions of dental students regarding their clinical training. **Methods.** This mixed method study using Clin Ed IQ questionnaire was conducted on Dental students graduating from both Private and Public sector institutes of Karachi. The questionnaire had four sections, the first three based on various aspect of clinical training, with responses based on 5-point Likert scale. Section four had open-ended items about dental curriculum. **Results.** For responses of 220 participants related to the first three sections, mean and standard deviation was calculated. Section two about Involvement in specific learning activities, had the lowest composite mean score (8.4). Results for all responses of agreement were tabulated as percentages. Overall, the scores were positive, with Section three regarding interaction with clinical instructors having highest positive responses. Dental graduates of Private sector institutes were more satisfied by their clinical training. Thematic analysis of open-ended questions yielded themes related to trained faculty, communication skills, patient safety skills, diversity, and integrated curriculum. **Conclusion.** The students of both types of institutes reported lack of diversity in clinical cases and deficient feedback from instructors as their major concern. However, the results showed a positive perception to their clinical experiences. Institutes and regulatory authorities should address areas of concern, to ensure provision of a holistic clinical learning environment to dental graduates.

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Assessment of Student Perception Regarding Clinical Training in Undergraduate Dental Programs using Clin Ed IQ

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ABSTRACT

Purpose. Clinical training is essential part of the dental curriculum. Both clinical environment and Teachers are essential factors which affect the acquired clinical skills. The objective was to assess the perceptions of dental students regarding their clinical training. **Methods.** This mixed method study using Clin Ed IQ questionnaire was conducted on Dental students graduating from both Private and Public sector institutes of Karachi. The questionnaire had four sections, the first three based on various aspect of clinical training, with responses based on 5-point Likert scale. Section four had open-ended items about dental curriculum. **Results.** For responses of 220 participants related to the first three sections, mean and standard deviation was calculated. Section two about Involvement in specific learning activities, had the lowest composite mean score (8.4). Results for all responses of agreement were tabulated as percentages. Overall, the scores were positive, with Section three regarding interaction with clinical instructors having highest positive responses. Dental graduates of Private sector institutes were more satisfied by their clinical training. Thematic analysis of open-ended questions yielded themes related to trained faculty, communication skills, patient safety skills, diversity, and integrated curriculum. **Conclusion.** The students of both types of institutes reported lack of diversity in clinical cases and deficient feedback from instructors as their major concern. However, the results showed a positive perception to their clinical experiences. Institutes and regulatory authorities should address areas of concern, to ensure provision of a holistic clinical learning environment to dental graduates.

KEYWORDS: Clin Ed IQ, clinical training, dental curriculum

INTRODUCTION

In medical education, the presence of both competent instructors and a stimulating learning environment is essential to develop the requisite clinical skills of the students. In terms of the faculty, there are several qualities desirable in a good teacher including but not limited to being passionate, approachable, competent, empathetic, and virtuous. A teacher should also be able to plan and orient learning strategies as well as have a grasp on teaching methodologies for effective learning. Teaching in a clinical environment bears several challenges related to patient management and ensuring the appropriate clinical learning of the students simultaneously.[1] In this regard, different strategies such as bedside teaching, last-minute receptor, buzz groups, e-learning, integrated lectures, constructive feedback, and many others have been proposed.

Several reviews by Davis have served as catalysts to determine the attributes of an effective clinical teacher and desired components of the clinical setting for the most effective learning experience.[2-4] Heidenreich et al., after reviewing more than 600 manuscripts related to clinical teaching strategies in ambulatory care setting to identify the most effective teaching strategy, found limited evidence to support any single teaching method in ambulatory care setting.[2-4] On the contrary Davis et. al in several studies suggested certain learning techniques that are supported by changing the teacher`s clinical behaviour.[2-4] One of them is frequent feedback on the performance of students related to standards and comparing them to their colleagues. Other strategies included role-plays, peer feedback, stimulations requiring reflection and making choices. Previously, investigators studied the effectiveness of clinical teaching methods and the supportive clinical learning environment of schools [5-8] with similar results. Comparing reviews conducted on best practices in both medical education and dental education conclude that the students of dentistry put more emphasis on assessment of their performance by teachers.[1-4, 9, 10] Hence, students prefer an instructor who provides timely and accurate feedback.

Effective Clinical Dental Teaching inventory was developed by McGrath et al. to gauge students' views of clinical instructions.[6] This inventory asks students their opinions regarding their clinical instructors' ability to provide an optimum learning environment, managing the clinic, informing their goals, helping in understanding and retention of knowledge, assessing their work as well as giving feedback for improvement, and supporting self-directed learning. Dentistry is based majorly on clinical skills, and hence the students need to be graded and given feedback by the instructors on their clinical performance. The realization of the importance of the clinical teaching led to the development of Clinical Educational IQ (Clin Ed IQ), which was designed specifically with consideration of dental school environment and the abilities required in dental faculty and instructors for clinical teaching.[11]

The Clin Ed IQ is based on experiential learning theory to understand the process of instruction. It is designed as a validated questionnaire used for finding out various aspects of the clinical environment as well as the perception of learners towards the curriculum. The Experiential Learning Theory was proposed by John Dewey, coinciding with the social reforms at that time[12,13] The theory proposes that the curriculum should have a comprehensive approach keeping in mind the overall learning experience of the students. It is a student-centred approach that describes learning as an active process with the student being the active recipient. Students are graded and are supported by a reward or punishment system. Giving feedback to students is a particularly important academic activity. The ideology behind this is the growth of the individual. The content required for this idea is the development of personality and competence in utilizing resources to their fullest in planning, accepting new techniques, being persistent and committed to a task, working with team members of differences in opinions, and working for the welfare of others. Schooling is more functionally related to student`s experience, that is, less contrived and artificial. The aim is to increase competencies while contributing to the happiness and productivity of youth and adults.

In 2006, Henzi conducted an extensive survey across dental schools of North America regarding students' perceptions about their clinical education.[14] A total of 655 students, enrolled from the first to the final year of dental schools across 21 dental schools in North America took part in the survey. The study concluded that the students perceived clinical education as the strongest component of their academics and that the schools failed to provide a supportive learning environment which hindered their learning and development [11].

No data is available in the literature regarding problems related to clinical education and learning faced by dental students of Pakistan. This preliminary survey using the Clin Ed IQ will give an insight into the clinical educational process and implementation of curriculum experienced by dental students graduating from dental institutes affiliated with either private or public sector universities in Karachi, Pakistan. Comparing private and public sector institutes will help provide an overall perception of the pertinent issues across Karachi, which has many dental education institutes. In addition, the perspectives of students regarding the strengths and weaknesses of the clinical education process would identify focus areas which could be improved by the

regulatory authorities and respective institutes to provide a better clinical learning environment for the students resulting in competent clinicians.

MATERIALS AND METHOD

Permission to use Clin Ed IQ was obtained from Dr. David Henzi through email before designing the study. This mixed-method study was conducted at Jinnah Sindh Medical University from July to August 2018. Permission from the ethical review board of the Jinnah Sindh Medical University (reference no: 004 /15) was obtained. Sample population selected was recent graduates of 2017 and 2018 working as house officers in Karachi Medical and Dental College but graduating from both public and private dental institutions of Karachi. A sample size of 220 was calculated keeping a confidence interval of 95% with 5% chances of error. Quota sampling was done recruiting 110 dental graduates hailing from both public and private sector institutes. After getting consent, questionnaires were distributed to be filled. The demographic details of the participants including their gender, year of graduation and type of institute (Public or Private sector) were recorded.

After explaining the aim of the study to the participants, their consent was taken, and they were asked to respond to the various sections of the Clin Ed IQ questionnaire. The Section one and three contained 15 items each, which are related to Clinical learning Opportunities and Interaction with clinical instructors respectively. The section two had 13 items assessing the Involvement of learners in specific learning activities. The study participants were asked to mark the close-ended items on a rating scale with six options from Mildly Agree to Strongly Disagree. Open-ended responses to two separate items related to the positive and negative aspects of the curriculum of the undergraduate dental program were also recorded.

Data was analysed using SPSS version 23.0. Descriptive analysis of the students' responses for close-ended questions were summarized as means and standard deviations based on the type of institute. The responses related to the open-ended questions regarding curriculum were analysed thematically by all investigators. Themes were identified on basis of similarities in concept in broad terms such as patient safety, communication skills, learning environment, teaching methods and qualities of teacher.

RESULT

A total of 220 completed questionnaires were received. The total sample was distributed into two groups with equal number (n=110) of students belonging to dental colleges affiliated with private sector and public sector institutes Responses to the items based on rating scale were expressed in percentages as agreed or disagreed. The male to female ratio of the participants was 1:2 calculated from 150 responses from female and 70 from males.

Table 1. Mean Score and Standard Deviation on Each Clin Ed IQ Subscale According to University of Affiliation

S.No	Subscale	Private Mean and SD	Public Mean and SD	Composite Mean
1	Clinical Learning Opportunities	11.055±2.31	9.51±2.34	10.28
2	Involvement in Specific Learning activities	9.51±2.2	7.29±2.45	8.39
3	Interaction with Clinical Instructors	11.22±1.905	9.78±3.67	10.5

Table 1: Mean scores and deviation in the responses was calculated. Participants from Private sector institutes had the highest mean scores for all three sections with the least deviation in opinions/answers comparative to responses of participants from public sector institutes.

Table 1 Comparison of Responses in Agreement on Clinical learning Skills

Section 1 Clinical Learning opportunities		
Statement	**Private (Agreed responses in %)**	**Public (Agreed responses in %)**
I have experienced a good mix of patients, problems, and clinical experiences.	84.5	80.5
The learning opportunities and mix of patients were too diverse, preventing me from developing proficiency.	62	65
My experiences were repetitive and offered few new learning experiences.	81	75
I increased my independence in caring for patients.	85.5	73.5
I improved my communication skills.	75	72
I became more proficient in clinical skills because of opportunities to practice and receive feedback.	84.5	76.5
I have had the opportunity to work in a variety of patient care settings.	64.5	40.5
I have experienced a good mix of patients, problems, and clinical experiences.	90.5	62
Things moved too fast for me to really learn anything.	64.5	64
I felt like my time in the clinic was sometimes wasted with non-educational tasks such as calling patients for appointments, doing paperwork, standing in line at the cashier or dispensary, and waiting for faculty to check my work.	66.5	50
The clinic functioned smoothly so that I could efficiently provide patient care.	74	72
I did not feel like a useful member of the health care team.	66.5	34.5
Support staff were available and helpful.	77	53.5
I had adequate resources available to me, which facilitated my learning.	65.5	64.5
For most of my clinical education, I have worked consistently with the same instructors who know my abilities and learning needs, rather than having different instructors every day.	64	68

Table 2: The table summarizes responses in Agreement related to items on "Clinical Learning Opportunities". The highest difference in responses for this section between the participants from Private and Public sector institutes were related to two items. Students from Private sector institutes agreed (90%) that they had experienced a wide variety of patients, problems, and clinical experiences However, they also affirmed that they did not feel like a useful member of the health care team (83%).

Table 2 Comparison of responses in Agreement on Individual learning tasks

Section 2 Involvement in Specific Learning Activities		
Statement	**Private (Agreed responses in %)**	**Public (Agreed responses in %)**
Taking patient histories.	86	82.5
Performing patient examinations.	69	75.5
Taking the patient's vital signs.	70	51.5
Interpreting laboratory tests.	63	34
Assessing radiographic images.	74	74.5
Developing my own treatment plans.	76	45.5
Making case presentations to instructors.	65.5	39.5
Explaining the pathophysiology of patients' health problems to instructors and answering questions about pathophysiology.	58.5	45
Discussing assessment and diagnosis with patients.	78.5	54.5
Providing patient education.	86	64
Discussing the linkage of basic science concepts and clinic knowledge with my teachers in the clinic.	71.5	51
Discussing the linkage of oral and systemic health problems with clinical instructors.	75	54
Assisting faculty or residents with advanced procedures.	86	58

Table 3: The table summarizes the result of the responses in Agreement from section two of the questionnaire related to learner involvement in learning activities. Participants from Public sector institutes responded in agreement to more items as compared to respondents of the Private sector institutes group. However, for a few items, responses in agreement were higher for the Private sector institutes group. These were related to developing own treatment plans (76%), presenting cases to instructors (65.5%) and lab test interpretations (63%).

Table 3 Comparison of responses in Agreement on interaction with clinical instructors.

Section 3 Interaction with Clinical Instructors		
Statement	**Private (Agreed responses in %)**	**Public (Agreed responses in %)**
Established an active role for me in patient care and gave me responsibility for managing patient care appropriate for my training.	70.5	60.5
Failed to prepare me for patient encounters.	46	75
gave me specific and practical information that helped me improve my skills.	82	62
Instructed me at my level of knowledge and expertise rather than at their level of knowledge.	81	83
Provided consistent instruction and feedback.	87	79
Brought to my attention techniques and strategies that I had previously not seen.	76.5	79
This made every patient encounter a positive learning experience.	86	84.5
Created an environment in which I felt comfortable accepting challenges, even at the risk of making mistakes and encouraged me to ask questions without fear of being "put down."	70.5	73.5
Improved my understanding of clinical practice.	81	59
Discouraged me from taking risks or trying new things.	84.5	33.5
Did not check my work frequently and did not provide me with timely feedback when I needed it.	45	70
Demonstrated the value of respecting patient preferences even when they differed from my own.	65.5	75.5
It encouraged me to become increasingly independent over time.	77.5	60
Criticized me without offering suggestions for improvements.	71.5	71.5
Responded promptly to requests for consultation, assistance, feedback, or evaluation.	65.5	45

Table 4: This summarizes the responses in Agreement to the items in section three regarding interaction of the participants with clinical instructors. Responses in the Private sector group that were comparatively higher in agreement as compared to the public sector groups were for items are highlighted, with discouragement in risk taking or allowing the students to try new things found to be foremost.

Descriptive Analysis of Comments

The responses to the open-ended items in Section four of the questionnaire related to positive and negative aspects of the curriculum were found to be completed by only 40% of the participants. The remaining responses were either deficient (4%) or altogether missing (56%). They were not categorized according to the groups (private or public sector institutes), rather the overall responses were analysed as they were about the curriculum which is put forth by the local regulatory authority (Pakistan Medical Commission or PMC). After thematic analysis of the responses, three themes were deducted from comments on the positive aspects of the curriculum.[15] They included trained faculty, and communication skills. These themes were consistent in the responses of participants from both Private and Public sector group. Themes that were developed from the comments about the negative aspects of the curriculum included a) patient safety skills, b) diversity c) integrated curriculum. Few of these comments are quoted below from both positive and negative sections.

Positive Comments

- "There has been good supervision at all times of my clinical experience, helping me improve and be a little independent."
- "Improved clinical knowledge, hard work, and skills. Improved patient dealing, pathophysiology of diseases, taking histories and patient care protocol."
- "Professor/instructors/teachers are highly qualified and always offer aid/feedback/constructive criticism."
- "Exposure to work environment that test your ability to work hard determination. Working in an environment where we have exposure to working with different professionals and learning their different clinical techniques. It improves our ability to handle patient health care in the most stern and difficult circumstances."
- "Clinical postings during 3rd and 4th year played a positive role. Plus, pharmacology, oral pathology, oral surgery and oral medicine, operative dentistry were positive aspects that helped me a lot in practicing my profession."

Negative Comments

- "Limited patient diversity. Limited patient flow. Lack of new techniques."
- "Dealing with uncooperative patients and unnecessary competitiveness among colleagues."
- "Not getting certain cases more commonly encountered during clinical practice."
- "Biochemistry and community dentistry were useless according to my point of view. They are of no use in our clinical education."

DISCUSSION

This study was conducted to determine the perception of the dental students graduating from institutes of both private and public sector using the Clin Ed IQ regarding the standard of clinical dental education being provided to them. Even though regulatory bodies like the Pakistan Medical Commission (PMC) and Higher Education Commission (HEC) identify the core features of the curriculum for undergraduate dental programs in Pakistan, it is the institutes that are responsible for proper implementation of the curriculum and standards of clinical training. Therefore, it is essential that the perceptions of the primary stakeholders of dental programs, that is the dental students, is recorded. Only house officers were included in this study since they had completed their undergraduate studies and had experienced the clinical environment as well as teaching strategies in their respective institutes. Overall, the analysis showed that the respondents of the Private sector institutes were highly satisfied from their learning setting, teachers, and academics. In contrast, respondents from the public sector university group were found to be less satisfied with their involvement in specific learning activities.

Section 1

The responses in this section for agreement to the items were less for the public sector group as compared to the Private sector group. The participants' responses showed the major problems faced by the students graduating from institutes affiliated with public sector University was not being able to independently care for their patients. This could be due to the excessive number of patients that come to the Dental OPDs of public sector institutes because of the subsidized treatment provided to the patients. In addition, there is often an absence of a formal and organized system to assign patients to the students for their holistic care. Respondents from the public sector group also reported a lack of opportunities to practice and develop their clinical skills due to the absence of feedback from their instructors. Feedback is considered an essential component of clinical training and helps to direct the learning of the students towards areas of improvement while encouraging good performance.[16] In the absence of a formal system of feedback, the students would be unable to benefit maximally from their clinical performances and experiences. The respondents from the public sector group reported not getting opportunities to work in different clinical setups as compared to their

usual working environment and did not get a chance to encounter a wider mix of clinical experiences. The reason could be that Private dental institutes usually employ two types of clinical setups, one in the form of a dental OPD which caters to a larger number of patients, while the other on the model of private dental clinics. Since the dental OPDs present in public sector institutes function on only the first model, therefore the students are unable to experience the environment and functioning as present in Private dental setups. Participants from the public sector groups also affirmed that they did not feel like a useful member of the health care team, with the support staff either not available or unhelpful. Both these issues are again an inherent problem in public sector institutes, where the treatment and management of the patient is compartmentalized based on different dental specialties and additionally, the appropriate number of support staff like dental assistants is deficient, resulting in difficulty in practicing four handed dentistry and problems with efficient patient management.

Section 2

This section assessed clinical learning activities that the students were involved in within their institute. It is essential that the oral and dental presentations of the patient be linked with the systemic conditions that the patient suffering from. Therefore, skills like recording vital signs, interpreting lab results, and developing associations between the patient's systemic and oral conditions need to impart during the clinical training of dental students. In addition, formulating treatment plans, presenting them to the instructors and linking basic and clinical core concepts in the process as well as assisting the faculty during procedures were also experiences that were reported as being deficient in the training of the dental students of the public sector group. Also, an important aspect of clinical training is communicating the treatment plan to the patient effectively and to educate him/her regarding their oral condition, which was also reported as unsatisfactory in the learning process of the public sector group. In contrast, the private sector students reported better clinical learning activities for all the items in this section. The reason for this observation could be the greater number of students which are admitted in public sector institutes and a heavier patient load in public sector OPDs, which makes it difficult for the instructors to focus on the individual learning of the students, treatment planning and case presentation as well as communicating with and educating patients.

Section 3

In this section, which determined the satisfaction of the students in their interaction with their clinical instructors, it was seen that the public sector students were less satisfied in this regard. Specifically, aspects like improving the students understanding of clinical practice and encouragement to try new and innovation things was found to be most deficient. Other areas where the public sector students reported their dissatisfaction included preparation for student encounters and provision of feedback. The reason could again be the excessive patient flow which could prevent the clinical instructors from giving individual students the ample time and feedback required for a meaningful clinical encounter. It could also be attributed to the lack of training of faculty in terms of the importance and the method of providing feedback to students. However, besides this, the overall responses showed that most of the students of both private and public sector groups were found satisfied with their interaction with the instructors. Our findings prove that the instructors of both private and public sector universities were committed to teaching the clinical teaching of students.

Section 4

In other order to holistically train the dental students clinically, it is essential to provide them opportunities to interact with patients with a variety of clinical presentations. In addition, the chance to work in different setups, both public and private sector, enables the dental students to understand and experience the dynamics of both types of professional working environments. Ensuring that the students are abreast with the latest innovative techniques and technologies related to dental practice allows them to perform optimally in clinical setups, allowing evidence-based practices to facilitate patient care. This would also help them integrate effectively in the global dental community. Based on the responses of the participants, it seems imperative that enough supportive and auxiliary staff as well as s faculty be hired in institutes, to curtail the provision of unnecessary or non-academic tasks to the students. Furthermore, faculty development programs related to strategies of curriculum integration, whereby the seamless and meaningful amalgamation of basic and clinical sciences can be introduced in dental institutions.

Study Limitations and Strengths

Since house officers were included in this study, they were able to give an overall perception regarding their clinical training, as well as their opinions pertaining to the curriculum based on their firsthand experiences. Also, the questionnaire used in this study covers all the aspects of academic and clinical training ranging from learning environment to their interaction with clinical instructors. The students were also asked their opinion regarding positive and negative aspects of curriculum taught in dentistry. Hence, an adequate estimate for the issues faced by the students in these facets, as indicated by the results, can be made.

One of the limitations of our study was a limited sample size since only house officers employed at Karachi Medical and Dental College were included in the study which would not necessarily provide a representation of all private and public sector dental institutes operating in Karachi. Also, since quota sampling was conducted, with the greater number of private sector institutes, house officers graduating from all private institutes would not be adequately represented as compared to the public sector institutes. Many issues pertaining to the clinical training and implementation of the curriculum in various institutes may be an inherent issue of the institute and may not be related to the clinical training standards or curriculum design approved by regulatory authorities. Hence, the generalizability of our results is restricted. A larger sample size, including all public and private dental institutes would help to curtail this issue.

CONCLUSION

The study enabled the exploration of the perception of dental students hailing from both public and private sector institutes regarding various aspects of their clinical training. The students of both types of institutes reported lack of diversity in clinical cases and deficient feedback from instructors as their major concern. However, the results showed a positive perception to their clinical experiences. Overall, issues like the paucity of wider variety of clinical cases, lack of integration of basic and clinical concepts as well as problems in interpretation of lab results were affirmed by students of both sectors. It was seen that the students at public sector institutes faced more issues related to aspects of larger number of patients resulting in difficulty to concentrate on patient care holistically, with lack of feedback and encouragement from the instructors. The major concerns of the private sector students were a lack of training for patient encounters and as well provision of adequate feedback. It is imperative that the issues highlighted in this study be addressed at the institutional level in both public and private sector. In addition, regulatory authorities like PM DC should regularly enforce the standards of clinical training that it puts forth and ensure the upgradation and modification of dental curriculum for better integration of basic and clinical sciences as needed.

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